The Claims

What is claimed is:

1. A polymer matrix incorporating catalase co-immobilized with an analytic enzyme which generates hydrogen peroxide, wherein the concentration of catalase ranges from about 100 units/ml to about 1000 units/ml.

2. The polymer matrix of Claim 1, which is pH-sensitive.

3. The polymer matrix of Claim 1, which has a crosslinking proportion of between about 0.5 mol% and about 6 mol%.

4. The polymer matrix of Claim 1, which when hydrated has a thickness ranging from about 0.1 mm to about 3.0 mm.

5. The polymer matrix of Claim 1, wherein the analytic enzyme is glucose oxidase.

6. The polymer matrix of Claim 1, wherein the matrix is composed of hydroxypropyl methacrylate, N,N-dimethylaminoethyl methacrylate, and tetraethyleneglycol dimethacrylate.

7. A biosensor or analyte-responsive drug delivery device which contains a polymer matrix and an analytic enzyme that generates hydrogen peroxide, wherein the analytic enzyme is co-immobilized in the biosensor or drug delivery device with catalase at a concentration ranging from about 100 units/ml to about 900 units/ml.

8. The biosensor or drug delivery device of Claim 7, wherein the matrix is pH-sensitive.

9. The biosensor or drug delivery device of Claim 7, wherein the matrix is not pH-sensitive.

10. The biosensor or drug delivery device of Claim 7, which has a crosslinking proportion of between about 0.5 mol% and about 6 mol%.

11. The biosensor or drug delivery device of Claim 7, which when hydrated has a thickness ranging from about 0.1 mm to about 3.0 mm.

12. The biosensor or drug delivery device of Claim 7, wherein the analytic enzyme is glucose oxidase.

13. The biosensor or drug delivery device of Claim 7, wherein the analyte is detected by means of a pressure sensor.

14. The biosensor or drug delivery device of Claim 7, wherein the analyte is detected by amperometric means.

15. A method of making a polymer matrix for use in a biosensor or analyte-responsive drug delivery device containing an analytic enzyme that generates hydrogen peroxide, including a step of co-immobilizing the analytic enzyme with catalase at a concentration ranging from about 100 units/ml to about 1000 units/ml.

16. The method of Claim 16, wherein the polymer matrix is formulated to have a crosslinking proportion of between about 0.5 mol% and about 6 mol%.

17. The method of Claim 16, wherein the polymer matrix is formed to have a thickness when hydrated of between about 0.1 mm and about 3.0 mm.

18. The method of Claim 16, wherein the analytic enzyme is glucose oxidase.

19. A method of making a biosensor or analyte-responsive drug delivery device, comprising the steps of:

providing an analyte-sensitive enzyme that generates hydrogen peroxide,

providing catalase,

providing a pre-gel solution of polymerizable constituents,

combining the catalase at a concentration of between about 100 units/ml and about 1000 units/ml with the analytic enzyme in the pre-gel solution to produce an analytic pre-gel solution,

placing the analytic pre-gel solution in an appropriate support structure,

subjecting the analytic pre-gel solution to appropriate conditions to form a shaped polymer matrix having the catalase and the analytic enzyme co-immobilized therein,

providing sensing components capable of detecting a change proportional to the activity of the analyte-sensitive enzyme,

providing structural components necessary to construct a biosensor, and

functionally associating the shaped polymer matrix with the sensing and structural components to produce a biosensor.

20. The method of Claim 19, wherein the polymerizable constituents are hydroxypropyl methacrylate, N,N-dimethylaminoethyl methacrylate, and tetraethyleneglycol dimethacrylate, the shaped polymer matrix has a thickness of between about 0.1 mm and about 0.4 mm, and the analyte-sensitive enzyme is glucose oxidase.

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